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AIRBORNE INTERNET

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Abstract : Within wireless network are a relatively new field . They are able to establish a digital data network that is integrated both with vital in and between aircraft and the ground. It could alter hoe aircraft communicate with and track one another as well as how the air traffic control system monitors and tracks them . It is possible to communication vital data like weather, turbulence, and landing circumstances in addition to the distance between planes. In this paper there is information about working, architecture , benefits, drawback of the airborne internet in this paper.

IndexTerms **–** Digital data network ,Alter hoe aircraft communication.

I. INTRODUCTION

Utilizing technology comparable to that of the commercial internet , Airborne Internet is a peer to peer, private ,secure,and dependable aircraft communication network . It is an implementation tha links an airplane , together with the data transmitted over this communication link, to a ground based internet access node.It offers access to a multitude of online tools and information while in the air . It is practical and useful for a variety of tasks , including booking a route ,organizing travel and scheduling flights. It is helpful for communicating between airplanes as well as for supplying weather and adjacent airspace information.Due to the cable's diameter , land based lines have a physical data delivery capacity constraint. There is no such physical restriction that would allow for a higher capacity in aviation internet. It gives users the chance to access the internet at a much higher altitude than is possible with other traditional services and airplanes. First developed as a supplementary technology , airborne internet served NASA's Small Aircraft Transportation System.

The idea of idea of "Airborne Internet" applies network theory and ideas to the field of transportation . Information connectivity is the system's main objective. The system has to bulid a scalable, all purpose, multi-application data channel for persons in transit in order to accomplish that goal.

Airborne Internet connects airplanes to the internet , has the ability to assist and integrate a wide range of activities in the cockpit and cabin .An open system with a scalable architecture was recommended in the initial 1999 proposal . It would serve as a general data channel for multiple applications, including navigation , communication and surveillance. According to Airborne Internet , all participating aircraft support the network by functioning as peer to peer air to air relays and providing bandwidth even when they are not using it for personal use. Every aircraft in the network is a node.

II. COMPONENTS FOR INSTALLATION OF AIRBORNE INTERNET

[1] External Antenna
Because the signal line is external and can be positioned closer to the periphery of the sky, the signa, stability, and accuracy of this type of equipment will all be improved . The external antenna is the antenna and device separately . It is composed of the host , power line and signal line distant place.

[2]Internet hub installed in aircraft
An internet hub, sometimes called a network hub, is a device 's network connecting point. One tool for joining components of a Local Area Network (LAN) is an internet hub. To enable packet is duplicated from one of the hub's many ports to the others when it reaches one of the ports. The internet hub is usually powered by a regular wall outlet and is made of plastic. The internet hub was a common fixture in household until the early 2000's when broadband routers took their place. The application for security include audio or video recording in the cockpit, in flight video monitoring and flight traking or deviation monitoring.

Installation of Antennas

To access the internet using an airborne internet system , an antenna must be fixed to the side of the building or in office.

III. WHAT IS AIRBORNE INTERNET

The network called the Airborne Internet is being proposed with all of its nodes situated inside of airplanes. The network would be helpful to companies, individual internet users, and government organizations, particularly the military , in addition to its planned use in aviation communication , navigation, and surveillance(CNS).An aerial network may , for instance allow military aircraft to function during a conflict without requiring a ground based communications infrastructure. Additionally, civilian aircraft could be able to continuously track each other's whereabouts and fly trajectories thanks to such a network . The internet in the air won't be entirely wireless.

IV. WORKING OF AIRBORNE INTERNET

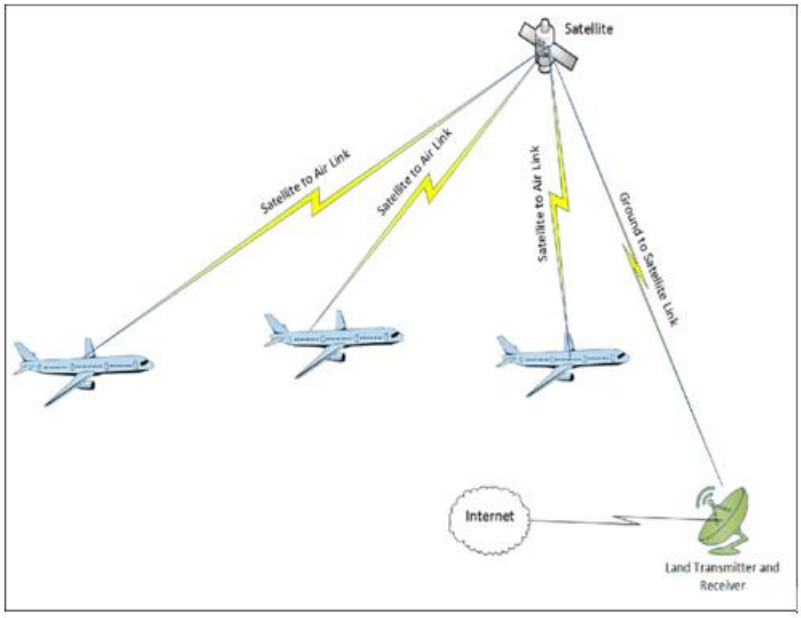
These days, we have so much more data to send and receive photos, videos, and audio files that our slow modems are being choked . To expand their bandwidth , a lot of internet users are moving to digital subscribe lines (DSL) and cable modems .Additionally ,a brand new services that will launch broadband into the air is being created .

At least three businesses intend to use fixed aircraft patterns across hundreds of cities to deliver high speed wireless internet access. High Altitude Long Operation (HALO), an airborne internet network planned by Angel Technologies, would employ lightweight aircraft to fly overhead and transport data to business more quickly than a T1 connection . Customer would receive a DSL-like connection.

The internet -equipped aircraft in the air will fly in a circle above at a height of between 52,000 and 69,000 feet (15,849 and 21,031 meters). The aircraft will be flying well above commercial airplanes at this level, untouched by bad weather.

The internet in air won't be entirely wireless. Any kind of aerial internet network will have components that are located on earth . In order for customers to receive signals from the network hub overhead, they will need to install an antenna on their residence or place of business. Additionally the networks will collaborate with well-know internet service providers (ISPs), who will lend the network access to their high capacity terminals. These ISPs already have fibre optics installed , so they have a fibre point of presence . What the satellite internet will accomplish is create a framework that can reach places without wires or broadband connections.

The aircraft's network hub, which is equipped with wireless technology, will send out a virtual cell signal that the antenna will pick up, allowing us to access the internet .Cities within a radius of around 75 miles can be covered by this service. The plane will be flying at 51,000 feet (15,500 meters).It operates at a high frequency of 28-38 GHz.



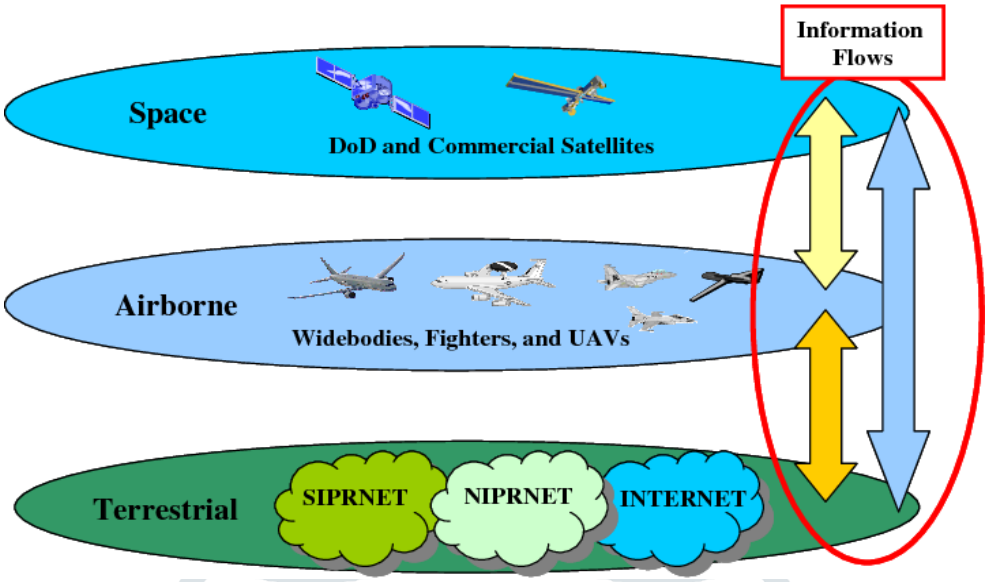
Airborne Internet Working

In the above as we can see that the ground signal signal is passed to satellite with the help of internet and land transmitter and receiver then the satellite provide the signals to aircraft with the help of Satellite to air link

V. ARCHITECTURE OF AIRBORNE INTERNET

An Airborne Network is a Medium Area Network (MANET) that facilitates communication sevices by a minimum of one node situated on a platform that can fly. Communication networks that are comprised of both aerial and ground nodes are known as “Airborne Network”. They can be classified as “opportunistic network” or as a particular type of ad hoc network due to their minimal reliance on the existing infrastructure . In addition to being helpful for commercial users, government organizations, and the military in particular, the network is designed for use in aeronautics Communications ,Navigation, and Surveillance(CNS).There are at least three main approaches suggested for frequently deploying communication nodes. There are three methods: using manned aircraft in the first, using unmanned aircraft in the second , and using blimps in the third. Surface to air, air to air and surface to surface communications are all possible through the nodes. The flight nodes, sometimes known as blimps, have a maximum altitude of 16 km and a maximum radius of 64 km. Networks in the air have a tendency to be quite heterogeneous. Combat aircraft and interceptors, for instance, have a high degree of mobility and aircraft motions may result in contacts spasmodically dropping because of misaligned antennas, unmanned aircraft , while blimps are used in the third method. Surface to air , air to air and surface to surface communication are all possible throught the nodes. The flight nodes, sometimes known as blimps, have a maximum altitude of 16 km and can cover areas with a 64 km radius . Airborne networks typically exhibit significant levels of variability. Combat and interceptor aircraft, for instance , exhibit high levels of mobility . As a result of antenna misalignment, aircraft movement, aircraft movements may cause contacts to spasmodically drop out.

Such intermittent connectivity are a common way to classify aircraft networks. Such airplanes in the network will cause abrupt connection failures and drastic topological changes. Helicopters and unmanned aerial vehicles (UAVs),for example, can hover over a specific area due to their significantly slower flight speeds. The limited battery life of handheld radios makes them less mobile when deployed as ground assets. While typical ad hoc routing protocols are meant for mobile nodes, their high speed motion and frequent connection failures may make them unsuitable for airborne nodes. Airborne network requires routing protocols that are both powerful and flexible enough to adapt to dynamic topology, high throughput,and a wide range of routing capabilities.



Airborne Network Architecture

In between terrestrial and space travel, airborne internet operates. Usually we receive our internet directly via satellite which takes time. Because aircraft are positioned between space and ground , we can access the internet quickly when using Airborne Internet . We are receiving internet access from Airborne level with a satellite connection, data flows from earth to space where satellite are present , and with an airborne internet connection, data flows both ways from satellite to airborne and back again. The aircraft connects to the internet and the internet employs a satellite broadband connection.

VI. Difference between airborne internet and satellite

	AI SERVICE	SATELLITE
Time Delay	Small Delay	Big Delay
Frequency	28-38 GHz	4-6 GHz 9-13 GHz
Power	Low Power	High Power
Cost	Low Cost	High Cost

VII. Application

1. Security Management: It can be used as a last mile access that provides high data rates without any interference because it is undetectable and does not require a license.

2.Enterprise Connectivity: Because FSO are readily upgradeable, they can be utilized to establish connected between building via Storage Area Networks (SANs) and Local Area Wireless Network (LANs).As a result ,it can be utilized to connect ground stations to structures, ships, and airplanes.

3. Defence: These can be utilized in military operations for communication or rescue missions since they are more dependable and simple to deploy.

4.Disaster recovery: When a natural disaster strikes, all of the existing links are broken. In this situation, hybrid FSO/RF or FSO can be utilized as a backup to continue operations.

5.Mobile Backhaul Connectivity: It can be used to quickly transport traffic to any base station , return it to a particular channel or expand the network of cellular phones.

VIII. ADVANTAGE

1.Boost economic growth and productivity: As connectivity grows, more people will be able to employ otherwise idle time when traveling by plane and operating at a larger volume.

2.Lower Cost: In addition to saving weight and space, aircraft owners will also save money as a result of the consolidation of flight deck duties and the reduction of the number of needed radii.

3.Boost Scalability, Dependability, and security.

4. Lower the Danger.

5.Foster More Creativity.

6.Be More Adaptable.

7.High Level of Redundancy.

IX. DISADVANTAGES

1.A limited area is covered by broadband internet.

2.Unreliable when functioning at a distance from the signal drops base station.

3. Limited Number of users of broadband

4.There's a bandwidth limit.

5.It Complement to Satellite System but can not replace it.

X. CONCLUSION

As a result , this aerial internet technology offers many benefits for aviation sevices, such as weather updates, aircraft tracking and air traffic control. It also gives travelers the chance to access the internet at extremely high altitudes, which is in line with other traditional services and aeroplanes. Thus, creating a network in the air to provide connectivity is a further new trend in this mobile era.

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